

## ABSTRACT

In a tunable optical source, a zone plate device 100 is used to provide frequency selective feedback to a laser diode 110. The zone plate device 100 is positioned to receive an output mode of the laser diode 110 and to return a frequency selected image of the mode spot to the laser diode 110. By changing the refractive index of material of the zone plate device 100, it is possible to change the frequency providing the image at the point of return to the laser diode 110. This allows the zone plate device 100 to be used in tuning the optical source, without using moving parts. In an embodiment, the zone plate device 100 is at least partially fabricated in an electro-optic material such as SBN:75 and can therefore be tuned by using electrodes to apply an electric field across it. The zone plate device 100 can be coupled directly to the laser diode 110 or via a waveguide section 105 which can be used to increase the output mode spot size from the laser diode 110 for delivery to the zone plate device 100. The zone plate device 100 can alternatively be used as a standalone component for filtering optical radiation from other sources. Tunable optical sources can be used for instance in communications, particularly wavelength division multiplexing.

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~~(Figure 1.)~~